

AUG 14 10 14 AM '96

WASTE MANAGEMENT  
DIVISION

## **UST CLOSURE AND LIMITED SOURCE INVESTIGATION**

**Taylor Appliances  
51 Berlin St.  
Montpelier, VT**

August 1996

In Accordance with  
VTDEC Contract #0963398

*Prepared for*

UST Program  
Management and Prevention Section  
Vermont Department of Environmental Conservation  
103 South Main St./ West Bldg.  
Waterbury, VT 05671-0404

*Prepared by*



P.O. Box 943/ 19 Commerce St.  
Williston, Vermont 05495  
(802) 865-4288

## **TABLE OF CONTENTS**

<b>I. INTRODUCTION</b>	<b>1</b>
<b>II. SITE BACKGROUND</b>	<b>1</b>
A. Site Setting	1
B. Site History	2
<b>III. INVESTIGATIVE PROCEDURES</b>	<b>2</b>
A. Limited Source Investigation/ Magnetometer Survey	2
B. UST Removal and Permanent Closure	3
C. Test Pit Excavations	4
D. Installation of Backhoe Monitoring Wells	5
E. Groundwater Flow Direction and Gradient	5
F. Groundwater Sampling and Analyses	6
G. Free Phase Product Sampling and Analysis	6
H. Sensitive Receptor Survey	7
<b>IV. CONCLUSIONS</b>	<b>7</b>
<b>V. RECOMMENDATIONS</b>	<b>8</b>
<b>REFERENCES</b>	<b>10</b>

## **APPENDICES**

**Appendix A - Site Maps**  
**Appendix B - UST Closure Report**  
**Appendix C - Liquid Level Data**  
**Appendix D - Groundwater Quality Data**  
**Appendix E - Free Phase Product Analysis**

## I. INTRODUCTION

This report provides a summary of the UST Closure and Limited Source Investigation completed at the Taylor Appliances property on Route 2 (at 51 Berlin St.) in Montpelier, Vermont (see Site Location Map in Appendix A). Results of the following investigative tasks performed by Griffin International, Inc. (Griffin), are presented:

- ◇ limited source investigation/ magnetometer survey;
- ◇ underground storage tank (UST) closure;
- ◇ test pit excavations and monitoring well installations;
- ◇ site survey;
- ◇ determination of groundwater flow direction and gradient;
- ◇ groundwater sampling and analysis;
- ◇ free phase product sampling and analysis;
- ◇ sensitive receptor survey.

This work was performed under the Vermont Department of Environmental Conservation (VTDEC) Site Investigation Contract with Griffin, in accordance with the July 18, 1996, *Work Plan and Cost Estimate for UST Closure and Limited Source Investigation at Taylor Appliances, 51 Berlin St., Montpelier, Vermont*, prepared by Griffin and approved by the VTDEC.

## II. SITE BACKGROUND

### A. Site Setting

The Taylor Appliances property is located along the southwest side of Route 2 (also known as Berlin St.) in a commercial and residential area of Montpelier. The topographic surface at the site is mostly level. The property is bounded to the northeast by Route 2, a paved two-lane road. Across Route 2 and down a steep slope is the Winooski River, which is approximately 150 feet wide at this location and flows to the northwest past the site. To the northwest is Cumberland Farms, a gasoline service station and convenience store. To the southwest, the Taylor Appliances property is bounded by a steep bank with a concrete retaining wall at its base. Approximately thirty feet above the Taylor Appliances property near the top of this bank is a residential street. Several multi-story residential buildings are located along the southwest side of this road. Directly abutting the Taylor Appliances property to the southeast, is Cariveau's Gulf, a gasoline service station. A steep bedrock wall serves as the southwest boundary on the Gulf Station property and the southernmost portion of the Taylor Appliances property. Perched on top of this bedrock cliff above the Gulf Station is a multi-story residential building, located on the northeast side of Prospect Street.

The Taylor Appliances property is owned by Mr. and Mrs. Roland Lafayette. No supply well exists on the site. The area is serviced by municipal water and sanitary sewer systems (see approximate utility locations on the Site Map in Appendix A). Stormwater is directed off the

steep bedrock slope at the southwest boundary of the property to a shallow drainage swale which flows southeasterly to northeasterly along the approximate edge of the property to a subsurface stormwater drain. According to the owner of the Gulf Station, Mr. Michael Carriveau, this drain reportedly joins with a stormwater piping directed from a catchbasin on the Gulf Station property and subsequently flows toward a catchbasin in Route 2 (see Site Map). Stormwater is also directed from the parking area of the site by natural sheet drainage to these same catchbasins located along the southwestern side of Route 2. From these catchbasins, drainage pipes carry the stormwater directly across Route 2 to the Winooski River.

According to the Surficial Geologic Map of Vermont (Ref. 1), the site is underlain by sediments of recent alluvial origin. Bedrock at the site consists generally of Devonian-aged interbedded phyllites, limestone, and calcareous mica schists of the Barton River Member (Ref. 2). The Taylor Appliances property is positioned on the western limb of a syncline. Beds dip steeply and are overturned in the vicinity of the Site.

## **B. Site History**

Free product has recently been detected in a monitoring well (MW4) on the Carriveau's Gulf Station property. The gasoline and diesel USTs located in closest proximity to MW4 on the Gulf Station property reportedly passed recent tightness tests. During an area reconnaissance conducted by representatives of the VTDEC to determine potential sources for this free product, it was determined that an abandoned, small-volume, UST was located on the Taylor Appliances property off the southeast exterior wall of the building. This UST had historically been used to contain No. 2 fuel oil, but had been abandoned for several years. The present owners of the Taylor Appliances property, the Lafayettes, were not aware of the presence of this UST when they purchased the property circa 1984. Griffin was contracted by the VTDEC to conduct a limited source investigation on the Taylor Appliances property and to coordinate closure of the No. 2 Fuel Oil UST.

## **III. INVESTIGATIVE PROCEDURES**

The following investigative tasks were undertaken at the Taylor Appliances property to evaluate the possible source of free product in well, MW4, on the Carriveau's Gulf station property:

1) limited source investigation and magnetometer survey to investigate the possibility of additional USTs on the Taylor Appliances property; 2) removal and permanent closure of a No. 2 Fuel Oil UST; 3) test pit excavations and backhoe monitoring well installations; 4) groundwater sampling and analyses; and 5) free phase product sampling and analysis.

### **A. Limited Source Investigation/ Magnetometer Survey**

Representatives of the VTDEC UST Program had previously identified the location of the No. 2 Fuel Oil UST on the Taylor Appliances property by magnetometer survey and by identification of vent piping on the southwest corner of the building. The location of the buried fill pipe for the

UST had been confirmed by hand digging. Responses of the magnetometer indicated the size of the UST to be analogous to that of a 550-gallon capacity tank.

Adjacent property owners recalled the presence of an additional UST on the Taylor Appliances property. These same individuals reported that additional structures had once been on the Taylor Appliances property, which suggested that additional USTs or possibly buried containers may be on the site. On July 17, 1996, Griffin conducted a site reconnaissance to inspect for evidence of additional USTs or buried containers on the property. No vent or fill piping, other than that which was associated with the No. 2 Fuel Oil UST, was identified. No unusual surface depressions or mounds were identified which could be suggestive of a buried object of significant size. No unusual petroleum staining or areas of stressed vegetation were observed. The property owner, Ms. Lafayette was unaware of additional USTs which may be on the property.

A magnetometer survey was conducted over the portion of the Taylor Appliances property which is currently surfaced with a compacted pavement material and gravel mixture (see Site Map, Appendix A). New and used appliances and pallets were stockpiled on a portion of this parking area south of the shed and the No. 2 Fuel Oil UST, thus precluding magnetometer survey in that area. In addition, vehicles parked along the southeastern edge of the parking area limited the magnetometer survey in that area. The magnetometer survey revealed four areas of substantial size which generated elevated readings on the magnetometer: one in the area of the No. 2 Fuel Oil UST, one in a five-foot diameter area at the southwest end of the access ramp leading from the Taylor Appliances front door, and two in the parking area in the approximate locations of test pits TP1 and TP2 on the attached Site Map. The elevated magnetometer readings at the end of the access ramp were likely due to iron rebar contained in the concrete basement. Ms. Lafayette indicated that the southeast portion of the Taylor Appliances building was an addition which was constructed within the last 12 years. Excavation for a full basement was conducted at the time, and no USTs or other large ferromagnetic object were reportedly encountered or buried during this construction phase.

#### **B. UST Removal and Permanent Closure**

The No. 2 Fuel Oil UST was removed and permanently closed on July 19, 1996. Griffin inspected the UST removal and closure process. A UST Closure Report was completed by Griffin and filed with the VTDEC UST Program on July 24, 1996 (see a copy of this report in Appendix B). Upon excavation, the UST was determined to be approximately 1000 gallons in capacity. Approximately one inch of water (equivalent of 5 gallons in a 1000-gallon tank) was measured in the waste fluids in the UST prior to removal. A maximum reading of 9.0 parts per million (ppm) was detected with an HNu Model HW-101 portable photoionization detector (PID) in soils from beneath the UST. A mild petroleum odor and petroleum sheens were noted on soils and groundwater which collected in the tank pit. Five holes, ranging in size from 0.05 inch to 0.2 inch, were observed in the end of the tank which was positioned in the southwest end of the tank pit. These data indicated that a release of petroleum product had occurred from the No. 2 Fuel Oil UST.

### C. Test Pit Excavations

A test pit was excavated in each of the two areas identified from the magnetometer survey in the central and southeast portions of the parking area on the Taylor Appliances property. Soils encountered in these excavations were logged and soil samples were collected from various depths for analysis of total volatile organic compounds (VOCs) by PID, utilizing a headspace screening method. A small horse-shoe shaped steel object was identified in TP1 at an approximate depth of 1 foot below ground level. No ferromagnetic object of significant size was identified in TP2. The following data were obtained during test pit excavations:

#### **TP-1**

Depth (ft below grade)	Description	PID Reading (depth(ft)/ ppm)
0 - 0.5	Pavement and sand/gravel fill material, dry	
0.5 - 3	Coarse to fine SAND and fine GRAVEL fill material with cinders, dry	2.0/ 0.1
3 - 8	Yellow brown to tannish brown, very fine grained SAND, some silt, moist	6.0/ 0.0
8	Bedrock refusal	7.5/ 0.0

#### **TP-2**

Depth (ft below grade)	Description	PID Reading (depth(ft)/ ppm)
0 - 0.25	Pavement and sand/gravel fill material, dry	
0.25 - 2	Coarse to fine SAND and fine GRAVEL fill material with cinders, dry	
2 - 7.5	Yellow brown to tannish brown, very fine grained SAND, some silt, damp	3.0/ 0.0
		5.5/ 0.0
		7.5/0.0
7.5	Bedrock refusal	

Following removal of the No. 2 Fuel Oil UST, excavation was continued in the pit to determine vertical extent of contamination, and to permit installation of a backhoe well. Excavation was completed to an approximate depth of ten feet below ground surface. No bedrock was encountered to this depth.

#### **TP-3**

Depth (ft below grade)	Description	PID Reading (depth(ft)/ ppm)
0 - 0.25	Topsoil, organic material	
0.25 - 6.5	Medium to fine SAND and medium to fine GRAVEL fill, moist	1.5/ 0.0
		2.5/ 0.0
		3.5/ 0.1
		5.5/ 0.5

### **TP-3 (cont.)**

<u>Depth</u> <u>(ft below grade)</u>	<u>Description</u>	<u>PID Reading</u> <u>(depth(ft)/ ppm)</u>
6.5 - 10.0	Yellow brown to tannish brown, very fine grained SAND, some silt, damp	7.0/ 1.0 7.0/ 9.0

### **D. Installation of Backhoe Monitoring Wells**

A monitoring well was installed by hand in each of the three test pits on the Taylor Appliances property. Wells, MW1 and MW2, were constructed in TP1 and TP2, respectively. These wells were each constructed of a five-foot length of 2-inch diameter, 0.010-inch, factory slotted, Schedule 40 PVC pipe, with attached bottom cap, flush-threaded to a 2-inch diameter, Schedule 40, PVC riser pipe. MW3, constructed in TP3, had a ten foot length of screen connected to a bottom cap. Each well was constructed by first placing a temporary, 10-foot length of 4-inch PVC casing to the bottom of the test pit and holding it vertically upright in the hole. The joined sections of riser, screen, and bottom cap were placed inside the 4-inch temporary casing. No. 1 sand pack was slowly placed in the annulus between the screen and the 4-inch casing. The temporary casing was simultaneously raised from the test pit as the backhoe operator backfilled the test pit with native materials. Backfilled soils were machine-tamped to a depth of approximately 3.5 feet below grade. From 3.5 feet to surface, soils were compacted in lifts with a gasoline powered compactor. A six-inch bentonite pellet seal was installed above the sand pack. The PVC well riser was cut off approximately one-half foot below grade and fitted with a lockable gripper cap, and a eight-inch protective road box was installed to secure the well.

The three wells have the following completion specifications:

<u>Well No.</u>	<u>Screened Interval</u> <u>(ft below grade)</u>
MW1	7.4 - 2.3
MW2	7.1 - 2.0
MW3	8.2 - 0.5

### **E. Determination of Groundwater Flow Direction and Gradient**

The three monitoring wells were located in azimuth and elevation, relative to prominent site features, including the Taylor Appliances building, Route 2, and the two existing monitoring wells and USTs on the adjacent Gulf station property. Survey data were utilized to prepare the Site Map contained in Appendix A. The well with the highest riser pipe elevation (MW1) was assigned an arbitrary datum of 100 feet in elevation.

Prior to groundwater sampling on July 24, 1996, the three on-site monitoring wells and the two pre-existing monitoring wells on the adjacent Gulf Station property, were monitored for presence of free floating product and depths to water. Results are tabulated as Liquid Level Monitoring Data in Appendix C. No free phase product was detected in the wells on the Taylor Appliances

property or in MW5 on the Gulf Station property. Approximately 0.23 foot of free phase product was detected in MW4 on the Gulf Station property. For each of the wells not containing product, the measured depth to water was subtracted from the surveyed elevation of the measurement reference point, to determine the water table elevation.

Water table elevations were plotted on the site map to generate the Groundwater Contour Map presented in Appendix A. This figure illustrates that groundwater flow was directed generally northward at an oblique angle to the Winooski River. Under this flow regime, MW4 is located in a crossgradient position with respect to the former No. 2 Fuel Oil UST location on the Taylor Appliances property, and directly downgradient with respect to the USTs and pump island on the Gulf station property. An approximate flow gradient of 0.09 was calculated for the July 24, 1996 data.

It is likely that the bedrock outcropping between the Taylor Appliances property and the Gulf Station property is serving as a partial divide of the overburden aquifer on these properties.

#### **F. Groundwater Sampling and Analyses**

A groundwater sample was collected from each of the three monitoring wells on the Taylor Appliances property on July 24, 1996, using disposable bailers. In addition, a trip blank, equipment blank, and duplicate sample were collected in accordance with State guidelines and for Quality Assurance/ Quality Control (QA/QC) purposes. Groundwater samples were analyzed for presence of benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl-tertiary-butyl-ether (MTBE) and Total Volatile Hydrocarbons (TVHs) by EPA Method 8020 at the VTDEC laboratory in Waterbury, Vermont. Analytical results are summarized in tabular form in Appendix D; groundwater standards are provided for reference in this summary table. Appendix D also contains the laboratory data sheets. Analytical results of the trip blank, duplicate sample, and equipment blank indicate that adequate QA/QC was maintained throughout sample collection and analyses.

None of the targeted petroleum-related constituents were detected in the samples collected from MW1 and MW2, located upgradient of the former No. 2 Fuel Oil UST. Relatively low concentrations of ethylbenzene and total xylenes were detected in MW3, located in the former UST pit. Constituent concentrations were plotted on the site map to generate the Contaminant Distribution Map contained in Appendix A. The downgradient extent of dissolved petroleum contamination is unknown, based on currently available data. The detected concentrations of ethylbenzene and total xylenes in MW3 were below their respective applicable groundwater standards.

#### **G. Free Phase Product Sampling and Analysis**

To assess the nature of the free product contained in MW4 on the Gulf Station property and to obtain additional information with regard to a potential source of this product, a free product sample was collected from this well on July 19, 1996, using a disposable bailer. To provide site-specific product standards for analysis of this free product sample, a sample of the No. 2 Fuel Oil



contained in the UST on the Taylor Appliances property and a sample of diesel product contained in a UST on the Gulf Station property were also collected. The free product samples were submitted to Eastern Analytical Laboratories of Concord, New Hampshire for a fingerprint analysis by Gas Chromatogram/ Flame Ionization Detector (GC/FID) methods. Results of the analysis including chromatograms are included in Appendix E.

The product in MW4 was identified as a No. 2 Fuel Oil by EAL. According to the analyst, Ms. Donna Stannic (telephone conversation, August 2, 1996), diesel and No. 2 Fuel Oil are essentially the same product, and therefore have very similar chromatograms. EAL would identify either diesel or No. 2 Fuel Oil as "No. 2 Fuel Oil" according to their laboratory protocols. Thus, the data indicate that the product in MW4 is either diesel or No. 2 Fuel Oil. Data are insufficient to ascertain the source of the MW4 product.

#### **H. Sensitive Receptor Survey**

The area surrounding Taylor Appliances was inspected on July 17, and July 19, and July 24, 1996 for potentially sensitive receptors to subsurface petroleum contamination detected on the Taylor Appliances property. The area is serviced by a municipal water source and not by on-site groundwater supply wells.

The basement of the Taylor Appliances building is immediately adjacent to and on the downgradient side of the former on-site UST pit. There have been no reports of petroleum vapors in this basement or the upper stories of this building.

The Winooski River is located approximately 180 feet in a projected downgradient direction from the former UST pit. Given the low source strength (below applicable groundwater standards) in the area of the former UST pit, and the sufficient travel distance between the UST pit and the Winooski River, subsurface petroleum contamination on the Taylor Appliances property is expected to pose minimal environmental risk to the River. The Winooski River was visually inspected from Route 2 on July 24, 1996. No free product or petroleum sheens were observed on the water surface along the southwestern bank of the river across from the Gulf Station, Taylor Appliances, and the adjacent Cumberland Farms. The steep bank prevented close inspection of river bank soils.

#### **IV. CONCLUSIONS**

Based upon the results of the above investigative tasks, Griffin presents the following conclusions:

1. A previously abandoned 1000-gallon, No. 2 Fuel Oil UST system was removed from the Taylor Appliances property. Presence of a small volume of water in the UST, detection of soil and groundwater contamination in the UST pit, and identification of five small holes in the tank indicate that a petroleum release has occurred from this UST.

2. Petroleum contamination exists on the Taylor Appliances property in the dissolved phase (in groundwater) and the adsorbed phase (to soils). No free phase product was detected on the Taylor Appliances property.
3. No evidence of additional USTs, buried containers, or other potential sources of petroleum products on the Taylor Appliances property was found through visual inspection and magnetometer survey.
4. Bedrock outcrops on the subject property and the adjacent properties. Bedrock controls the thickness of the overburden aquifer on the Taylor Appliances property, and likely causes a partial divide in the overburden aquifer between the Taylor Appliances property and the adjacent Gulf Station. Bedrock was encountered at 7.5 to 8 feet near the southeastern and central portions of the Taylor Appliances property. Bedrock was greater than 10 feet below ground surface in the area of the former UST. July 24, 1996 groundwater elevation data indicate that groundwater in the overburden aquifer flows northerly at an oblique angle to the Winooski River. Depth to groundwater ranges from approximately 2 to 6 feet below ground surface in the vicinity of the Gulf Station and the Taylor Appliances property.
5. Dissolved petroleum contamination on the Taylor Appliances property appears limited to the immediate vicinity of the former No. 2 Fuel Oil UST. Low concentrations (below applicable standards) of ethylbenzene and total xylenes are present in shallow groundwater in this location. The downgradient extent of dissolved contamination is unknown.
6. Analytical results of free product collected from MW4 indicate that this product is either diesel or No. 2 Fuel Oil. Data are insufficient to ascertain the source of the MW4 product.
7. Given the overburden groundwater flow direction determined for the vicinity of the Taylor Appliances property, and given the relatively limited source strength in the former No. 2 Fuel Oil UST pit on this property, the free product in MW4 is not likely migrating from the Taylor Appliances property.
8. Risks posed to potentially sensitive receptors of subsurface petroleum contamination on the Taylor Appliances property appear minimal, based on currently available data.

## V. RECOMMENDATIONS

Based upon the above conclusions, Griffin offers the following recommendations:

1. Given the relatively low concentrations of petroleum constituents in MW3, located in the source area of the former No. 2 Fuel Oil UST, and given that none of the applicable groundwater enforcement standards have been exceeded, no further investigation or monitoring of subsurface petroleum contamination on the Taylor Appliances property appears warranted at this time.

2. Monitoring wells on the Taylor Appliances property should be maintained in the short term for potential use in further area subsurface investigations relative to source determination for the free product in MW4 on the Gulf Station property.
3. Area properties upgradient of MW4 should be inspected for presence of USTs, aboveground storage tanks, buried containers, or other sources of No. 2 Fuel Oil or diesel.
4. Excavations should be conducted along the southwestern side of the municipal water line, to the northwest and southeast of MW4, to determine if free product is migrating in a preferential pathway along the higher conductivity fill material surrounding this utility, from the Gulf station or another property located along this utility line.
5. Additional monitoring wells should be installed on the Gulf Station property, in an upgradient (southerly) direction from MW4, to assess the potential nature and degree of subsurface contamination on this property. The construction specifications for existing wells, MW4 and MW5, should be determined. Groundwater monitoring wells on the Gulf Station property should be sampled and analyzed for presence of petroleum constituents. Since the Gulf Station property USTs have passed recent tightness tests, the focus of further subsurface investigations on the Gulf Station property should be to assess the potential for accidental spills or overfills or dispenser equipment malfunctions as possible sources for product in MW4.

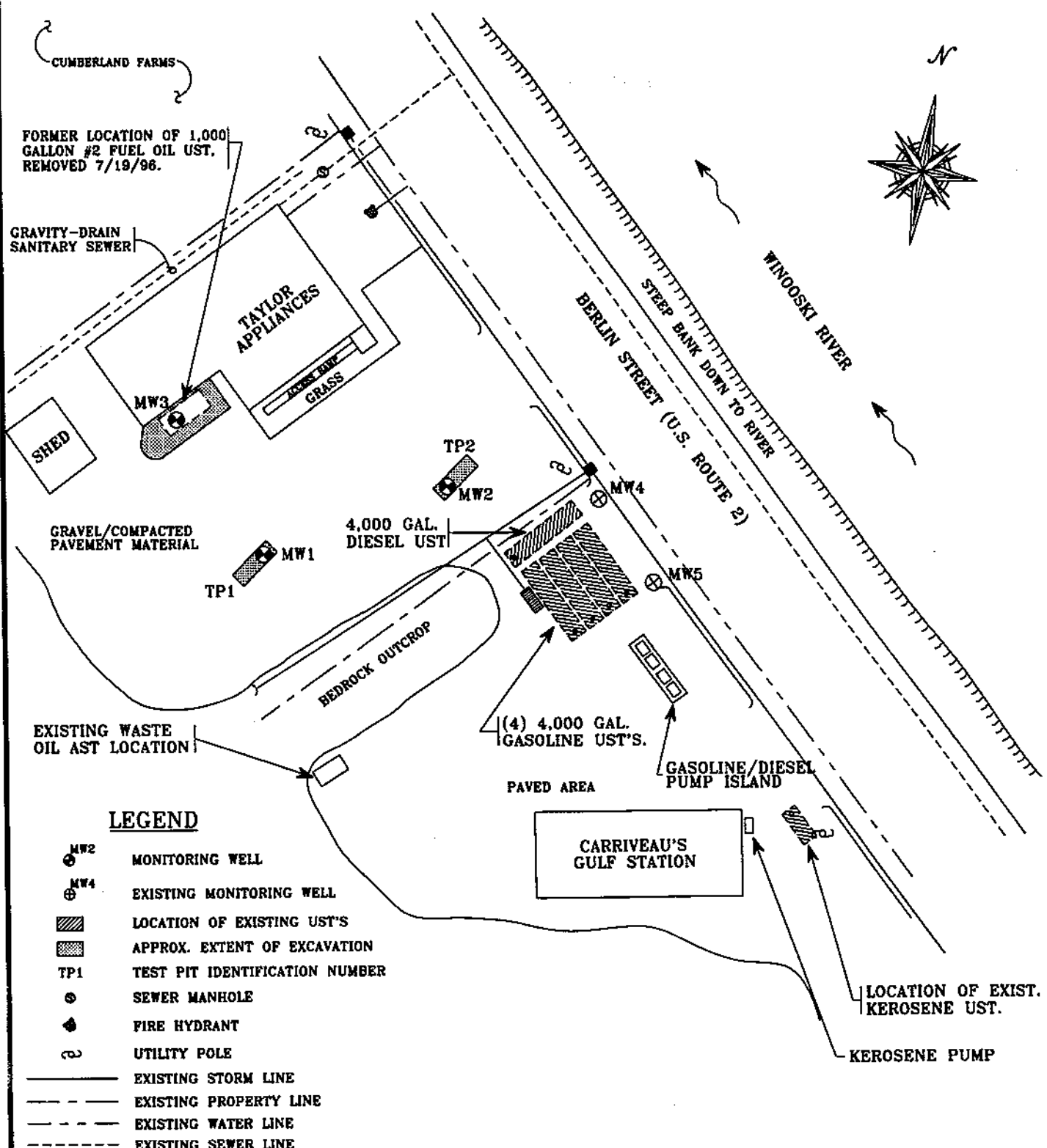
## REFERENCES

1. Doll, Charles G., ed., 1970, *Surficial Geologic Map of Vermont*, State of Vermont.
2. Doll, Charles G., ed., 1961, *Centennial Geologic Map of Vermont*, State of Vermont.
3. Murthy, Varanasi Rama, 1957, *Bed Rock Geology of The East Barre Area, VT*, Vermont Geological Society Bulletin No. 10.

## **APPENDIX A**

### **Site Maps**





JOB #: 7964873  
 SITE SURVEY CONDUCTED ON 7/24/96; LOCATIONS OF UNDERGROUND UTILITY LINES APPROXIMATE.

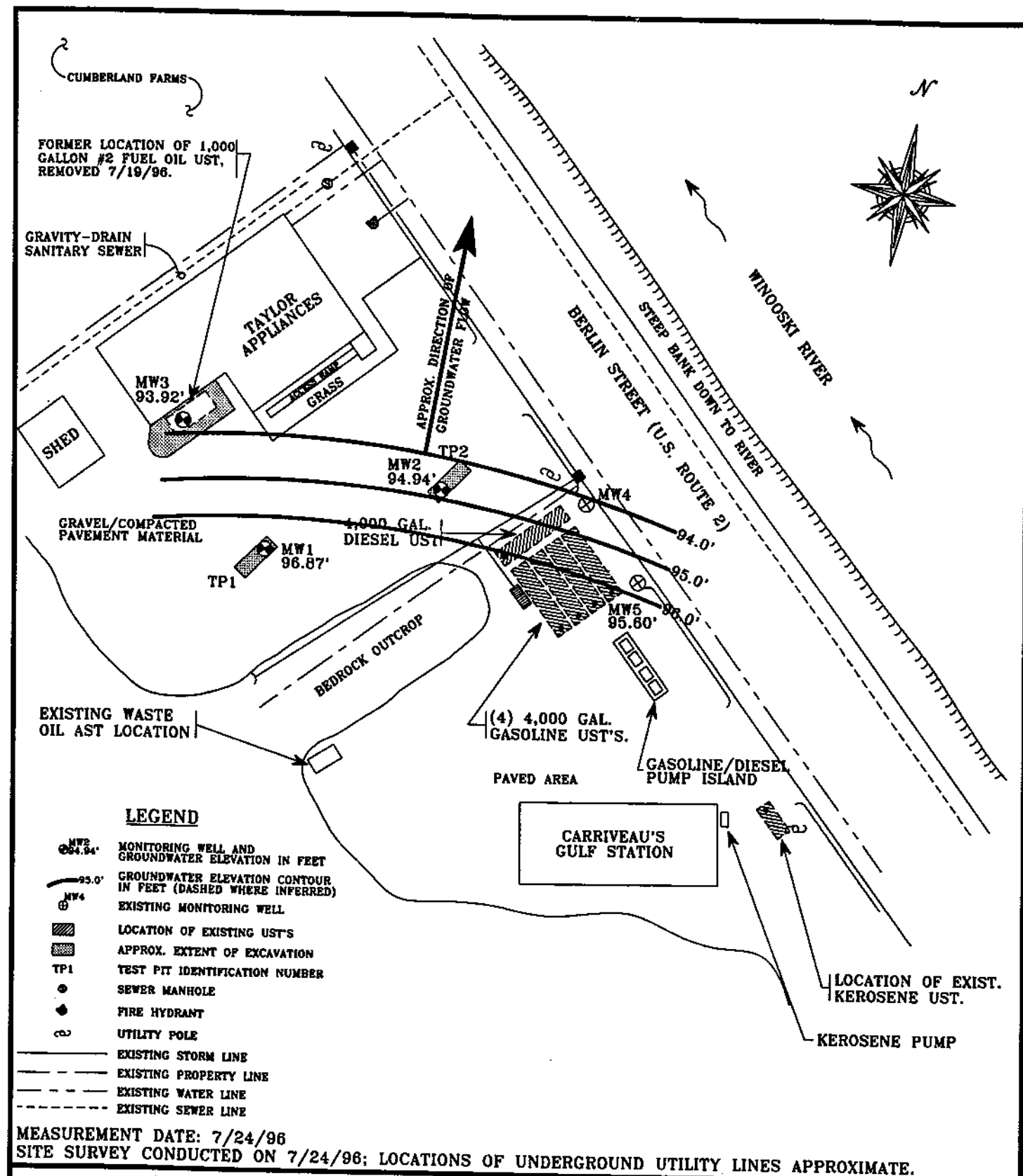


# **TAYLOR APPLIANCES**

51 BERLIN STREET, MONTPELIER, VERMONT

## **SITE MAP**

DATE: 7/25/98	DWG.#: 2	SCALE: 1"=40'	DRN.:SB	APP.:KU
---------------	----------	---------------	---------	---------



JOB #: 7964873

**TAYLOR APPLIANCES**

51 BERLIN STREET, MONTPELIER, VERMONT

**GROUNDWATER CONTOUR MAP**

DATE: 7/29/96

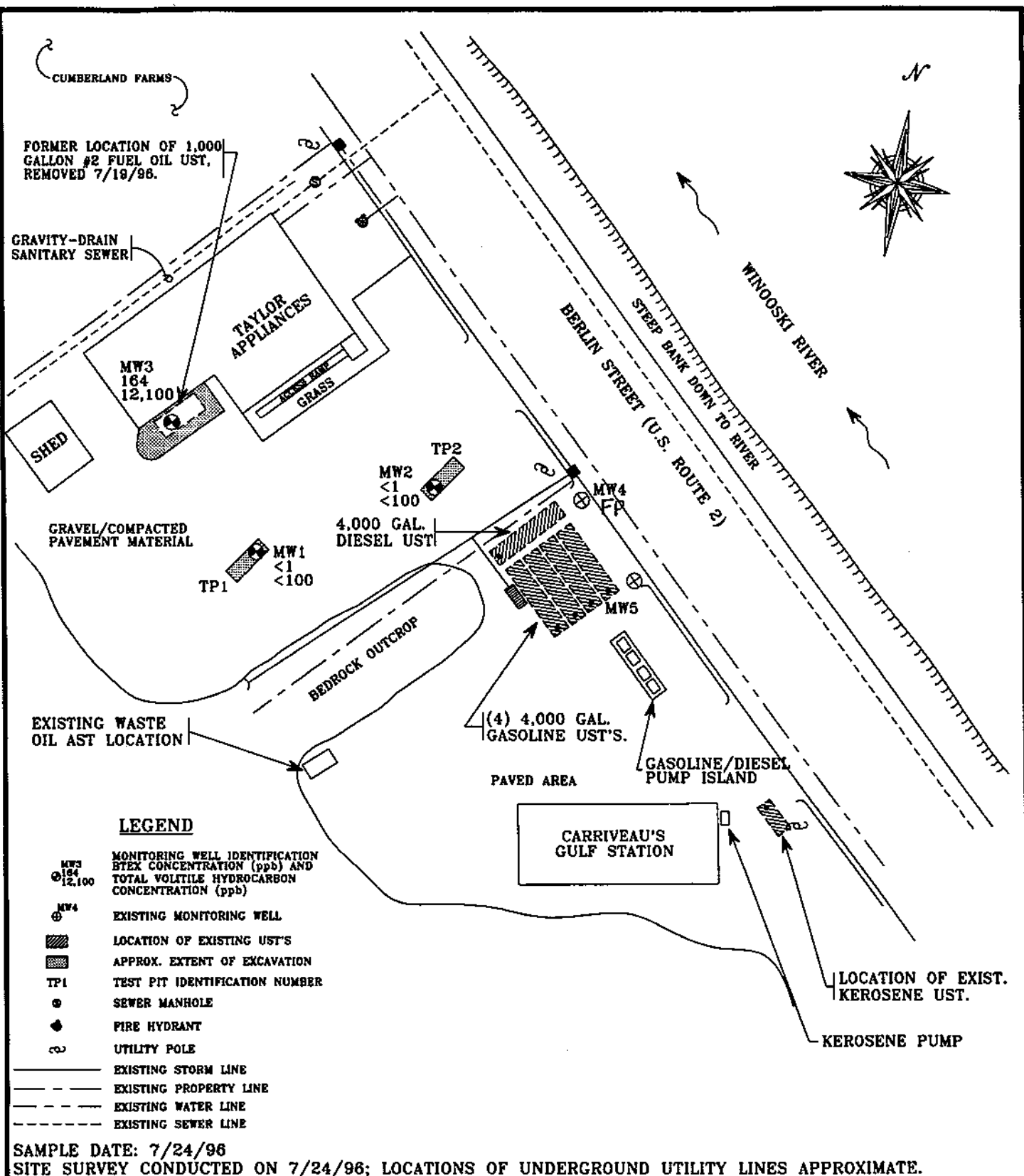
DWG. #: 3

SCALE: 1"=40'

DRN.:SB

APP.:KU





JOB #: 7964873

# **TAYLOR APPLIANCES**

51 BERLIN STREET, MONTPELIER, VERMONT

## **CONTAMINANT DISTRIBUTION MAP**

DATE: 8/5/96

DWG. #: 4

SCALE: 1" = 40'

DRN.:SB

APP.:KU

**APPENDIX B**

**USTClosure Report**



July 24, 1996

Ms. Sue Thayer  
VT Department of Environmental Conservation  
Waste Management Division  
103 South Main Street/ West Bldg.  
Waterbury, VT 05671-0404

RE: Underground Storage Tank Removal  
Taylor Appliances  
51 Berlin St., Montpelier, VT

Dear Ms. Thayer:

On July 19, 1996, I conducted an inspection of the removal and permanent closure of one. 1000-gallon, underground storage tank (UST) at the Taylor Appliances property at 51 Berlin St. in Montpelier, Vermont. The UST was of single-walled steel construction, used to contain No. 2 fuel oil. The tank had been out of service for at least 12 years according to the property owner, Mr. Roland Lafayette. Enclosed are the completed State of Vermont UST Permanent Closure Form, a Site Location Map, and photographs of the tank removal.

The Taylor Appliances property is located in a commercial and residential area of Montpelier on the southwest side of Berlin St. (Route 2). The area is serviced by municipal water, sanitary sewer system, and stormwater drains. The stormwater drains lead to the Winooski River which flows northwesterly past the site on the other side of Berlin St. According to Mr. Lafayette, there are no known water supply or monitoring wells on the subject property (except for three monitoring wells constructed on the date of the UST closure). Mr. Lafayette also indicated that there are no known, in-use public or private water supplies within one-half mile of the property.

The UST is owned by the property owners, Mr. & Mrs. Lafayette. The age of the UST is unknown. Unknown to the Lafayette's, the UST was present on the property at the time of their purchase approximately 12 years ago. No other USTs are known to be located on the property.

The UST was excavated on July 19, 1996, by Thygesen Construction of Barre, Vermont. MacIntyre Fuels of Middlebury, Vermont, performed tank inerting and cleaning. Approximately

145 gallons of old fuel oil product and a small amount of water (approximately one inch, or the equivalent of approximately 5 gallons in a 1000-gallon tank) were pumped from the UST prior to its removal. Approximately 15 gallons of fuel oil and sludge were removed from the tank during cleaning. Waste liquids were drummed on site; waste will be transported from the site by Environmental Products and Services of South Burlington on Friday, July 26. Holes were cut in the UST on site to permit cleaning. The tank and piping were removed from the site by MacIntyre Fuels and transported to Rowe's Salvage in Milton for sale as scrap metal.

Soils revealed in the tank pit excavation consisted predominantly of coarse to fine sands, with some silt and some gravel from surface to approximately 6.5 feet. Below 6.5 feet to the full extent of excavation (approx. 10 feet), soils consisted of predominantly fine sand and silt. The top surface of the tank was revealed at about 2.5 feet below ground surface on the southeast side of the Taylor Appliances building. Soils around the northeastern and southeastern sides of the tank were excavated to an approximate depth of 6.5 feet and 4.0 feet, respectively, below ground surface to free the tank for removal. Additional soil was excavated from the pit to obtain soil samples for PID screening (see next paragraph) and to permit installation of a backhoe well as part of an Expressway investigation authorized by the VTDEC. Two additional monitoring wells were also installed in test pits located elsewhere on the Taylor Appliances property. Results of this site investigation will be presented in a separate report to the VTDEC. Groundwater was encountered in the UST pit excavation at an approximate depth of 7 feet below grade. Bedrock was not encountered during the excavation which extended to approximately 10 feet below grade. Mild petroleum odors and petroleum sheens were noted in soils and groundwater from the bottom of the excavation. No free product was noted on the groundwater in the pit.

Soil samples were collected from the walls of the UST excavation and from directly beneath the UST on the bottom of the excavation. Soil samples were collected for head space analysis of volatile organic contaminants (VOCs) using an HNu Model HW-101 portable photoionization detector (PID). Soil sample locations are illustrated in the Site Diagram on Page 2 of the tank closure form. The following table provides soil screening results:

No.	Depth (ft)	PID	
		Reading (ppm)	Description
1	0.5	0.2	North side of fill pipe
2	0.5	0.0	South side of fill pipe
3	1.5	0.0	Beneath vent piping connections
4	1.5	0.0	5ft along piping from tank connections, beneath pipe
5	0.25	0.0	Beneath vent piping at southwest building wall
6	2.5	0.0	South side and top of UST
7	1.5	0.0	Beneath copper tubing
8	5.5	0.5	NE side (end) of UST
9	3.5	0.1	SE side of UST

No.	Depth (ft)	PID	Description
		Reading (ppm)	
10	7.0	1.0	Beneath NE end of UST
11	7.0	9.0	Beneath SW end of UST

The excavated tank was in poor condition. Five small (0.05-inch to 0.2-inch in diameter) holes were identified in the end wall and sides of the tank which was the in-situ southwest end of the tank. The piping was in fair condition with minor surficial rust and pitting. No holes were visible in the piping.

As groundwater had been impacted by petroleum contamination, all excavated soils, in addition to approximately 6 yards of clean fill material, were backfilled into the excavation. No replacement tank was installed.

Visual observation on the date of the tank closure indicates limited environmental risk to potentially sensitive receptors in the area of the Taylor Appliances property. The Winooski River is located approximately 100 feet to the northeast and topographically downgradient of the property across Route 2. Area residences are serviced by municipal water supply and not on-site groundwater supply wells. No petroleum vapors have been reported in the Taylor Appliances basement.

In summary, examination of excavated soils and of the UST system removed from the Taylor Appliances property located at 51 Berlin St., in Montpelier, Vermont, indicates that a release of petroleum hydrocarbons has occurred from the UST. An Expressway Site Investigation is underway at this property under contract to the VTDEC.

Please do not hesitate to call, should you have any questions.

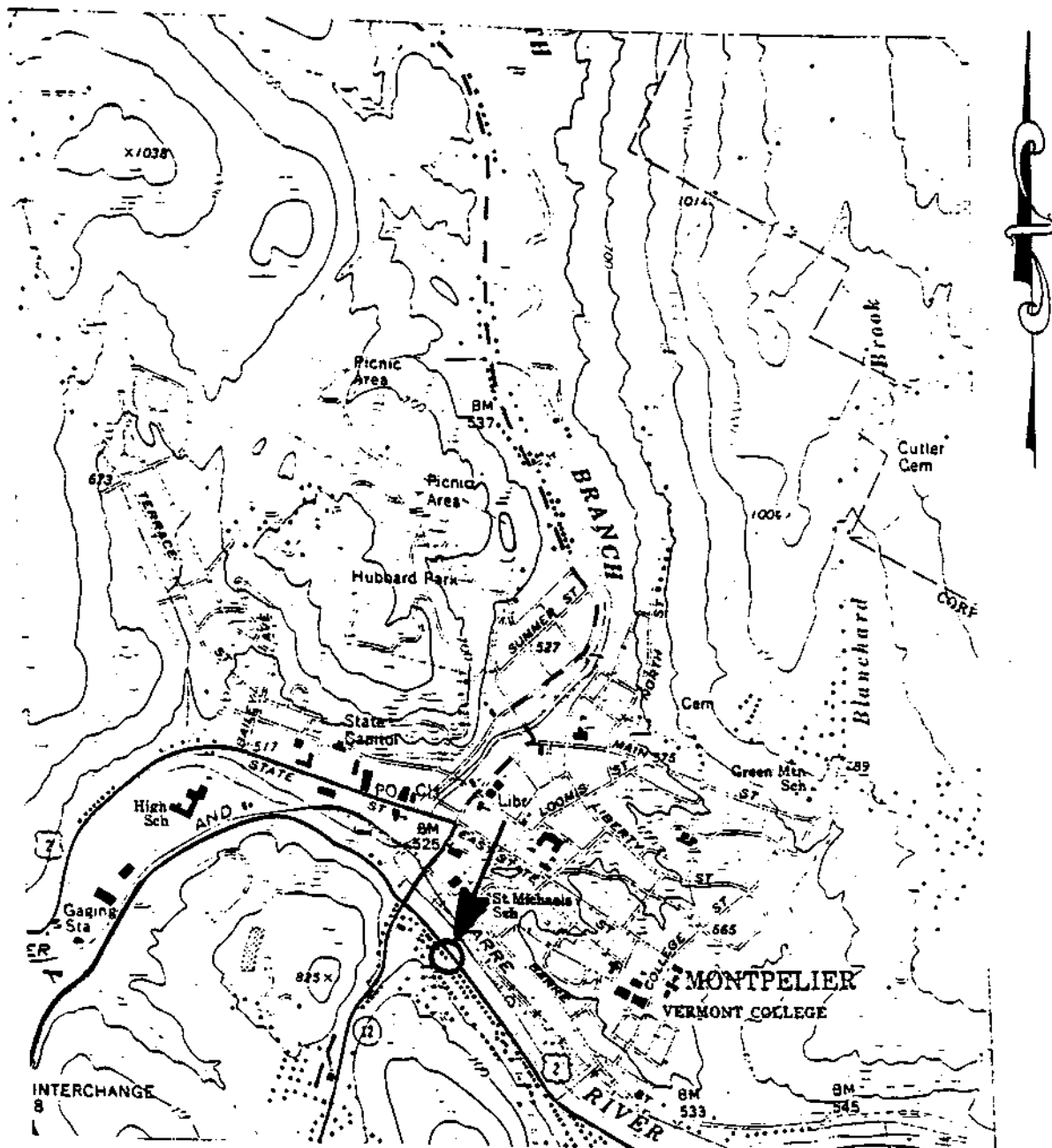
Sincerely,



Kristen Underwood  
Hydrogeologist

Encl.

cc: Mr./Mrs. Lafayette  
Ted Unkles, VTDEC UST Program  
GI #7964873



JOB #: 7964873

SOURCE: USGS- MONTPELIER, VERMONT QUADRANGLE



**TAYLOR APPLIANCES**

MONTPELIER,

VERMONT

**SITE LOCATION MAP**

DATE: 7/23/96

DWG.#:1

SCALE: 1:24000

DRN.:SB|APP.:KU

# UNDERGROUND STORAGE TANK PERMANENT CLOSURE FORM

## AGENCY USE ONLY

ed. closure date: \_\_\_\_\_

Facility Town: \_\_\_\_\_

Facility ID#: \_\_\_\_\_

ST Official: \_\_\_\_\_

skated by: \_\_\_\_\_

VERMONT AGENCY OF NATURAL RESOURCES  
DEPT. OF ENVIRONMENTAL CONSERVATION  
HAZARDOUS MATERIALS MANAGEMENT DIV.  
103 SOUTH MAIN STREET, WEST BUILDING  
WATERBURY, VERMONT 05671-0404  
TELEPHONE: (802) 241-3888

Company conducting  
site assessment: Goffin Int.  
Person conducting  
site assessment: K. Underwood  
Telephone number of  
company (or person): 802-865-4283  
Date of UST closure: 7-19-96  
Date of site assessment: 7-19-96

This Closure Form may only be used for the facility and date indicated in the upper left hand corner. Changes in the scheduled closure date should be phoned in at least 48 hours in advance. Both the yellow and white copies must be re ned to the above address; the pink copy should be retained by the UST owner. A written report from an environmental consultant covering all aspects of closure and site assessment, complete with photographs and any other relevant data, must accompany this form. All procedures must be conducted by qualified personnel - including training required by 29 CFR 1910.120. Documentation of all methods and materials used must be adequate. All work must be performed in compliance with DEC policy "UST Closure and Site Assessment Requirements" as well as all applicable statutes, regulations, and additional policies. The DEC may reject inadequate closure forms and reports.

## Section A. Facility Information:

Name of Facility: Taylor Appliances Number of Employees: 3  
Street address of facility: 51 Berlin St. Montpelier, VT  
Owner of UST(s) to be closed: Roland Lafayette  
Name of Contact and telephone number if different from owner: \_\_\_\_\_  
Mailing address of owner: as above  
Telephone number of owner: 223-2891

## Section B. UST Closure Information: (please check one)

Reason for initiating UST Closure: ☐ Suspected Leak ☐ Liability ☐ Replacement ☒ Abandoned  
Which portion of UST is being closed: ☐ Tanks ☐ Piping ☒ Tanks & Piping

USTs undergoing permanent closure. Include condition and if leaks were found:

UST#	Product	Size (gallons)	Tank age	Tank condition	Piping age	Piping condition
	<u>No. 2 Fuel oil</u>	<u>1000</u>	<u>unknown &gt; 12 yrs</u>	<u>Poor (5 holes)</u>	<u>unknown &gt; 12 yrs</u>	<u>Fair</u>

Which tanks, if any, will be closed in-place (must have approval from DEC) None

Disposal/destruction of removed UST(s):

Location: Rowe's Salvage, Milton, VT Date: 7/19/96 Method: scrap metal Date: 7/19/96

Amount (gal.) and type of waste generated from USTs: 165 gal fuel oil, small vol. water tank bottoms

Tank cleaning company (must be trained in confined space entry): MacIntyre Fuels, Middlebury, VT

Certified hazardous waste hauler (tank contents are hazardous waste unless recovered and usable product): Enviro. Products & Services

Hazardous waste generator ID number: To be determined

UST is not closed. This portion must be filled in to include all USTs, regardless of size, and status, \*whether "abandoned", "in use", "to be installed", or "not aware of any other tanks on-site". Remember: most new installations require permits and advance notice to this office.

UST#	Product	Size (gallons)	Tank age	*Tank Status	Piping Age	*Piping Status
<u>1</u>	<u>other USTs known to be on site</u>					

## Section C. Initial site characterization:

Work in this section must be completed by a professional environmental consultant or hydrogeologist with experience in environmental sampling for the presence of hazardous materials. A full report from the consultant must accompany this form.

Excavation size (ft<sup>3</sup>): 90 Excavation depth (ft): 6.5 Soil type: Sand/gravel to fine sand Bedrock depth (ft): on prop. and s.p.

Pipe Information: Make: HNU Model: HNU-101 - unknown at UST, excavation location

ID calibration information: Date 7/19/96 Time 8:32 Type of Gas isobutylene  
Contamination detected with PID (pphm): Peak 9.0 Depth of peak (ft) 7 Avg 1.0  
oil samples collected for laboratory analysis? Yes        # of samples        No ✓  
Locations and depths of all readings and samples on diagram  
Have soils been polyencapsulated on site? Yes        list amount (cu. yds.):        No ✓  
Have any soils been transported off site? Yes        list amount (cu. yds.):        No ✓  
Soils transported to: N/A  
Date of DEC official granting approval to transport soils: N/A Date:    /   /     
Amount of soils backfilled (cu. yds.): all Avg. PID         
Have limits of contamination been defined? Yes        No ✓  
Are you aware of any other contaminants which may be present? Yes        No ✓  
Comments: Not on subject property

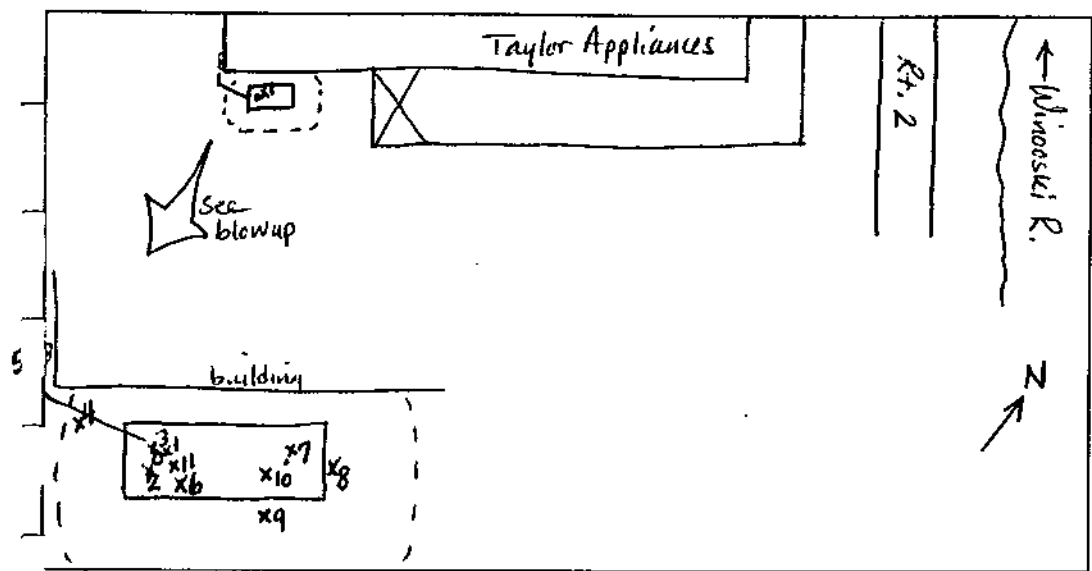
Free phase product encountered? Yes        thickness        No ✓  
Groundwater encountered? Yes ✓ depth(ft) ~7 No         
Were there existing monitoring wells on site? Yes        (# samples taken       ) No ✓  
Have new monitoring wells been installed? Yes ✓ (# samples taken       ) No        3 MWs; samples to be collected 7-24-96  
Samples collected from monitoring wells for lab analysis? Yes        No ✓  
Indicate well location, headspace readings, and laboratory results if applicable in a separate report and on the site diagram  
Is there a water supply well or spring on site? Yes        (check type: shallow        rock        spring       ) No ✓  
How many public water supply wells are located within a 0.5 mile radius? 0 \*min. distance (ft):         
How many private water supply wells are located within a 0.5 mile radius? 0 \*min. distance (ft):         
Have receptors been impacted? ✓ soil        indoor air ✓ groundwater        surface water        water supply         
\* according to Mr. Lafayette

**Section D. Statements of UST closure compliance:** (must have both signatures or site assessment not complete)  
As the party responsible for compliance with the Vermont UST Regulations and related statutes at this facility, I  
hereby certify that all of the information provided on this form is true and correct to the best of my knowledge.  
Date:         
Signature of UST owner or owner's authorized representative:       

As the environmental consultant on site, I hereby certify that the site assessment requirements were performed in  
accordance with DEC policy and regulations, and that information which I have provided on this form is true and  
correct to the best of my knowledge.  
Anthony J. Mendenhall Date: 7/19/96  
Signature of Environmental Consultant

**SITE DIAGRAM**

Show location of all tanks and distance to permanent structures, sample points, areas of contamination, potential  
receptors and any pertinent site information. Indicate North arrow and major street names or route number.

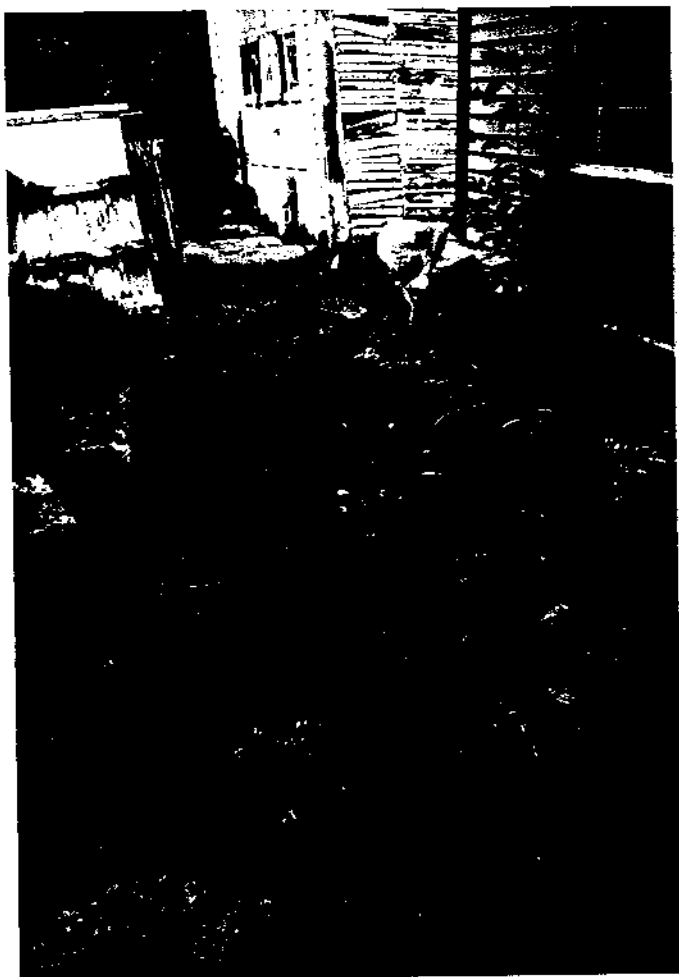


Return form along with complete narrative report and photographs to the Department of Environmental Conservation,  
Underground Storage Tank Program within 72 hours of closure.

x2 soil sample location and number



**SITE PHOTOGRAPHS**  
**UST Closure, Taylor Appliances Property, 51 Berlin St., Montpelier, VT**

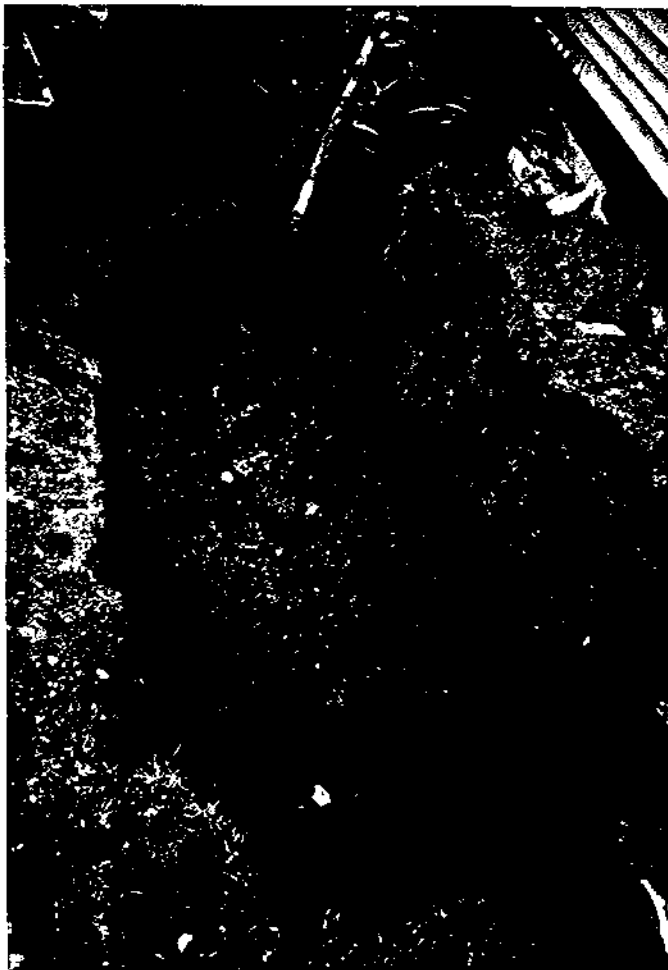


**General area of UST excavation,  
southeast side of building**



**UST In Place**

**SITE PHOTOGRAPHS**  
**UST Closure, Taylor Appliances Property, 51 Berlin St., Montpelier, VT**



**Excavation following UST removal**



**UST, Bottom view**

**SITE PHOTOGRAPHS**

**UST Closure, Taylor Appliances Property, 51 Berlin St., Montpelier, VT**



**Two of five holes in tank bottom**

## **APPENDIX C**

### **Liquid Level Data**

**Groundwater and Product Level Data**  
**Taylor Appliances property**  
**51 Berlin St.**  
**Montpelier, Vermont**

**Monitoring Date: July 24, 1996**

Well I.D.	Well Depth (ft)	Top of Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Specific Gravity of Product	Hydro Equivalent (ft)	Corrected Depth To Water (ft)	Corrected Water Table Elevation (ft)
MW-1	7.4	100.00	-	3.13	-	-	-	-	96.87
MW-2	7.1	97.67	-	2.73	-	-	-	-	94.94
MW-3	8.2	99.71	-	5.79	-	-	-	-	93.92
MW-4	ND	97.10	2.57	2.80	0.23	0.86	0.198	2.60	94.50
MW-5	ND	97.35	-	1.75	-	-	-	-	95.60

ND - Not Determined; Insufficient Data

"-" = Not Applicable

## **APPENDIX D**

### **Groundwater Quality Data**

**Groundwater Quality Summary**  
**Lake Buick**  
**South Burlington, Vermont**

**Sample Collection Date: July 24, 1996**

PARAMETER	MW-1	MW-2	MW-3	Quality Control Samples			Standards		
				Trip Blank	Equipment Blank	Duplicate (MW-3)	EPA MCL	VT HAL	VT GES
Benzene	ND > 1	ND > 1	ND > 5	ND > 1	ND > 1	ND > 5	5.0	1.0	5
Ethylbenzene	ND > 1	ND > 1	107	ND > 1	ND > 1	25	700	-	680
Toluene	ND > 1	ND > 1	ND > 5	ND > 1	ND > 1	ND > 5	1,000	-	2420
Total Xylenes	ND > 1	ND > 1	57	ND > 1	ND > 1	15	10,000	-	400
Total BTEX	ND > 1	ND > 1	164	ND > 1	ND > 1	40	-	-	-
MTBE	ND > 1	ND > 1	ND > 5	ND > 1	ND > 1	ND > 5	-	40	-
BTEX + MTBE	ND > 1	ND > 1	164	ND > 1	ND > 1	40	-	-	-
TVHs	ND > 100	ND > 100	12,100	ND > 100	ND > 100	6,800	-	-	-

All Values Reported in ug/L

ND - None Detected (greater than the specified quantitation limit)

MTBE = Methyl tertiary butyl ether

TVHs = Total Volatile Hydrocarbons

EPA MCL = Environmental Protection Agency Maximum Contaminant Level

VT HAL = Vermont Health Advisory Limit

VT GES = Vermont Groundwater Enforcement Standard as presented in VTDEC Groundwater Protection Rule and Strategy

8/01/96

Department of Environmental Conservation Laboratory  
Method 8020 - BTEX and MTBE in Water

SRL

Lab Id: 22195 Report To: GRIFFININTERNATIONAL Phone: 865-4288 Date Collected: 7/24/96  
Location: TRIP BLANK Program: 41 Chain of Custody? Yes

Notes:

Date Analyzed: 7/26/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

$\alpha,\alpha,\alpha$ -Trifluorotoluene 110% 4-Bromofluorobenzene . 101%

Notes: No second column confirmation used.

RECEIVED AUG - 2 1996

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve



8/01/96

Department of Environmental Conservation Laboratory  
Method 8020 - BTEX and MTBE in Water

SRL

Lab Id: 22196 Report To: GRIFFININTERNATIONAL Phone: 865-4288 Date Collected: 7/24/96  
Location: MW2 Program: 41 Chain of Custody? Yes

Notes:

Date Analyzed: 7/26/96 Over hold? No Dilution: 1

Parameter	Units are ug/l PQL	Result	Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.		6	Y	118
Toluene	1	N.D.		6	Y	114
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

 $\alpha,\alpha,\alpha$ -Trifluorotoluene 113% 4-Bromofluorobenzene . 103%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

8/01/96

Department of Environmental Conservation Laboratory  
Method 8020 - BTEX and MTBE in Water

SRL

Lab Id: 22197  
Location: MW1

Report To: GRIFFININTERNATIONAL

Phone: 865-4288

Date Collected: 7/24/96

Program: 41

Chain of Custody? Yes

Notes:

Date Analyzed: 7/26/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

 $\alpha,\alpha,\alpha$ -Trifluorotoluene 112% 4-Bromofluorobenzene . 104%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

8/01/96

Department of Environmental Conservation Laboratory  
Method 8020 - BTEX and MTBE in Water

SRL

Lab Id: 22198  
Location: MW3

Report To: GRIFFININTERNATIONAL

Phone: 865-4288

Date Collected: 7/24/96

Program: 41

Chain of Custody? Yes

Notes:

Date Analyzed: 7/26/96 Over hold? No Dilution: 5

Parameter	Units are ug/l PQL	Result	Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
Methyl-t-butylether	5	N.D.				
Benzene	5	N.D.				
Toluene	5	N.D.				
Ethylbenzene	5	107				
Total Xylenes	5	57				
Total Volatile Hydrocarbons	500	12100	E			

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

$\alpha,\alpha,\alpha$ -Trifluorotoluene 114% 4-Bromofluorobenzene . 117%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

8/01/96

Department of Environmental Conservation Laboratory  
Method 8020 - BTEX and MTBE in Water

SRL

Lab Id: 22199 Report To: GRIFFININTERNATIONAL Phone: 865-4288 Date Collected: 7/24/96  
Location: DUPLICATE MW3 Program: 41 Chain of Custody? Yes

Notes:

Date Analyzed: 7/26/96 Over hold? No Dilution: 5

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	5	N.D.				
Benzene	5	N.D.				
Toluene	5	N.D.				
Ethylbenzene	5	25				
Total Xylenes	5	15				
Total Volatile Hydrocarbons	500	6800	E			

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

$\alpha,\alpha,\alpha$ -Trifluorotoluene 112% 4-Bromofluorobenzene . 112%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

8/01/96

Department of Environmental Conservation Laboratory  
Method 8020 - BTEX and MTBE in Water

SRL

Lab Id: 22200 Report To: GRIFFININTERNATIONAL Phone: 865-4288 Date Collected: 7/24/96  
Location: EQUIPMENT BLANK Program: 41 Chain of Custody? Yes

Notes:

Date Analyzed: 7/26/96 Over hold? No Dilution: 1

Parameter	Units are ug/l PQL	Result	Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

 $\alpha,\alpha,\alpha$ -Trifluorotoluene 112% 4-Bromofluorobenzene . 124% S

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

## **APPENDIX E**

### **Free Phase Product Analysis**



# LABORATORY REPORT

Eastern Analytical, Inc. ID#: 6112 GFI

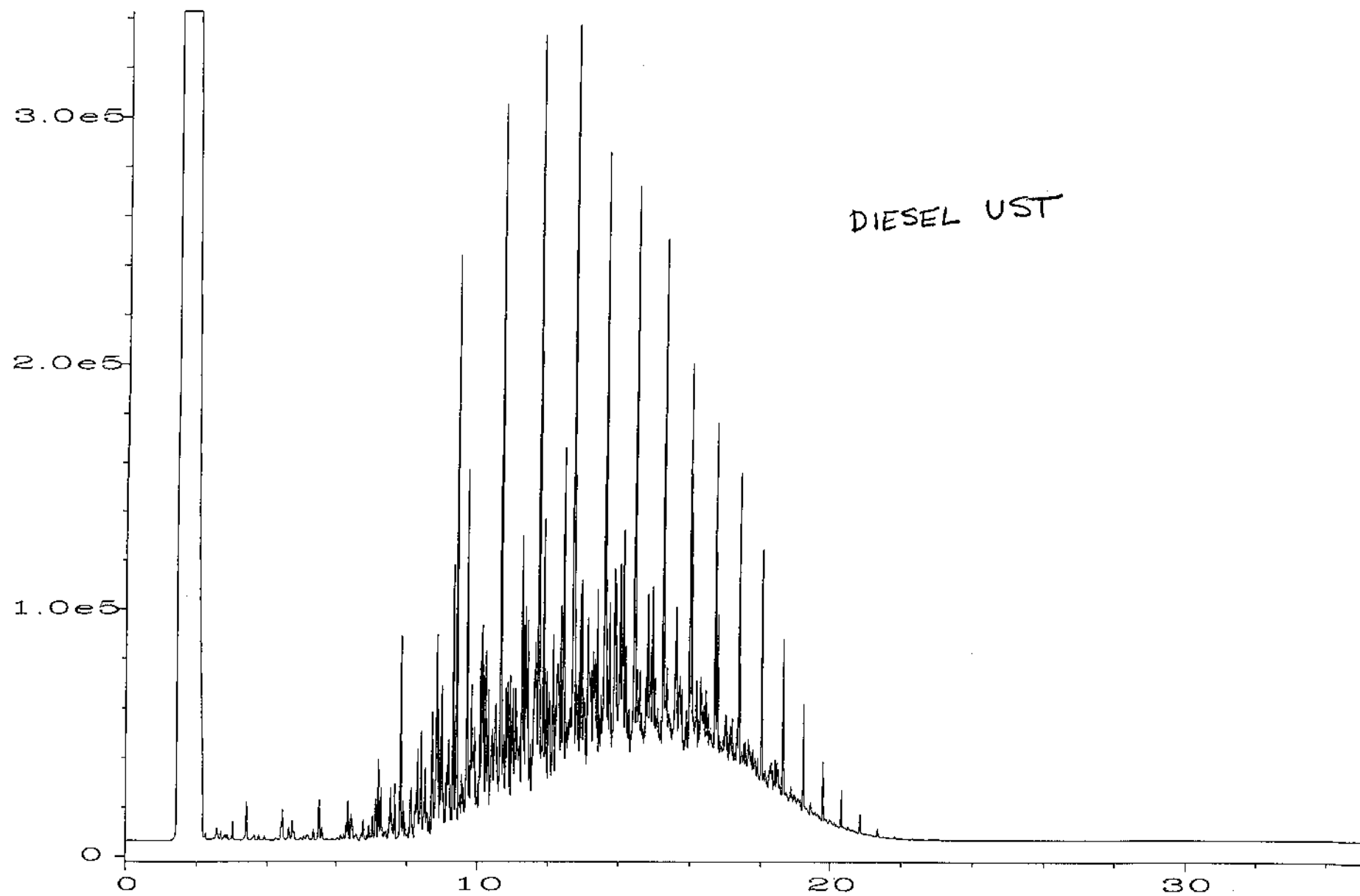
Client: Griffin International, Inc.

Client Designation: 7964873/Taylor Appliances

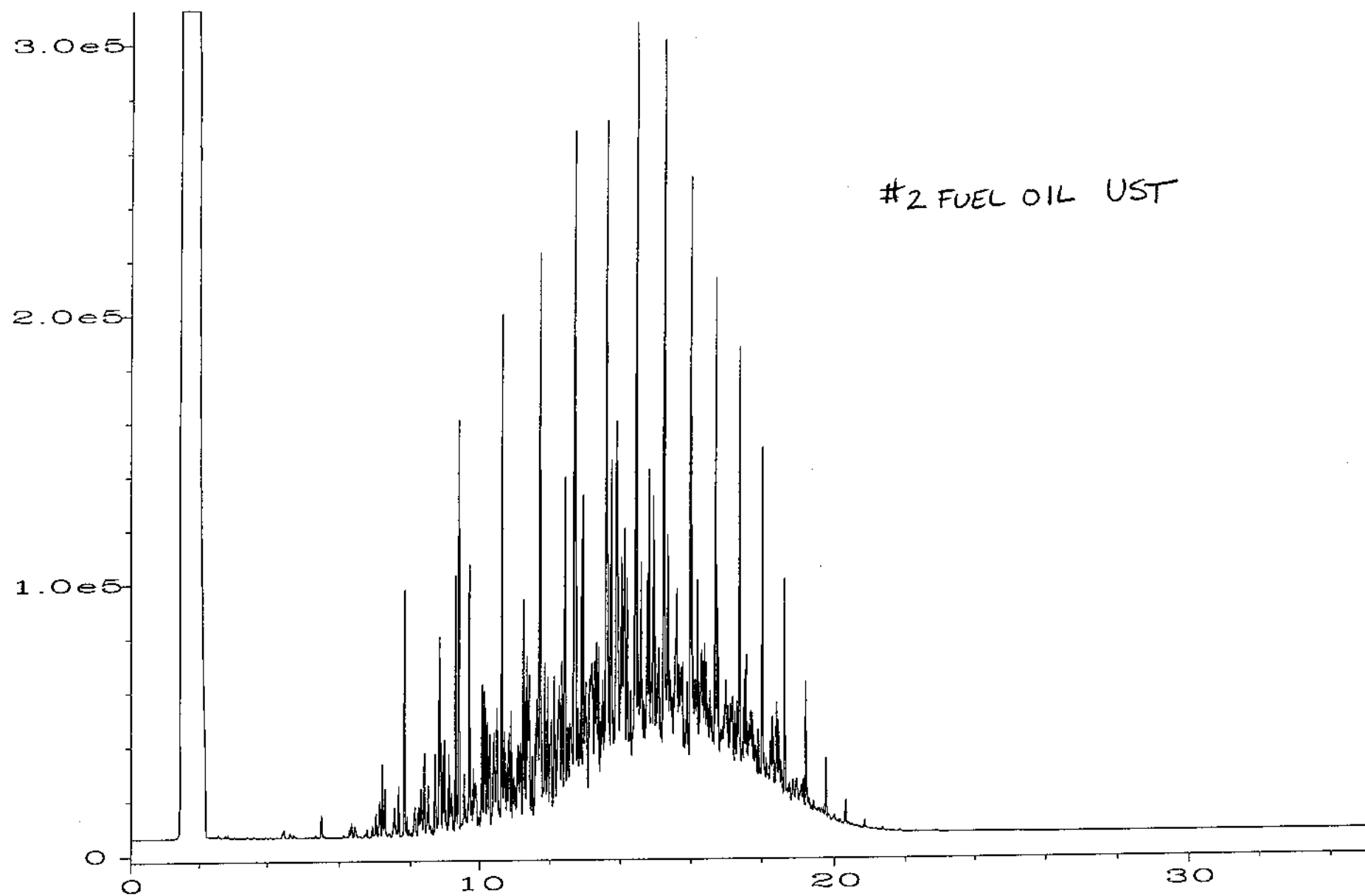
## Total Petroleum Hydrocarbons

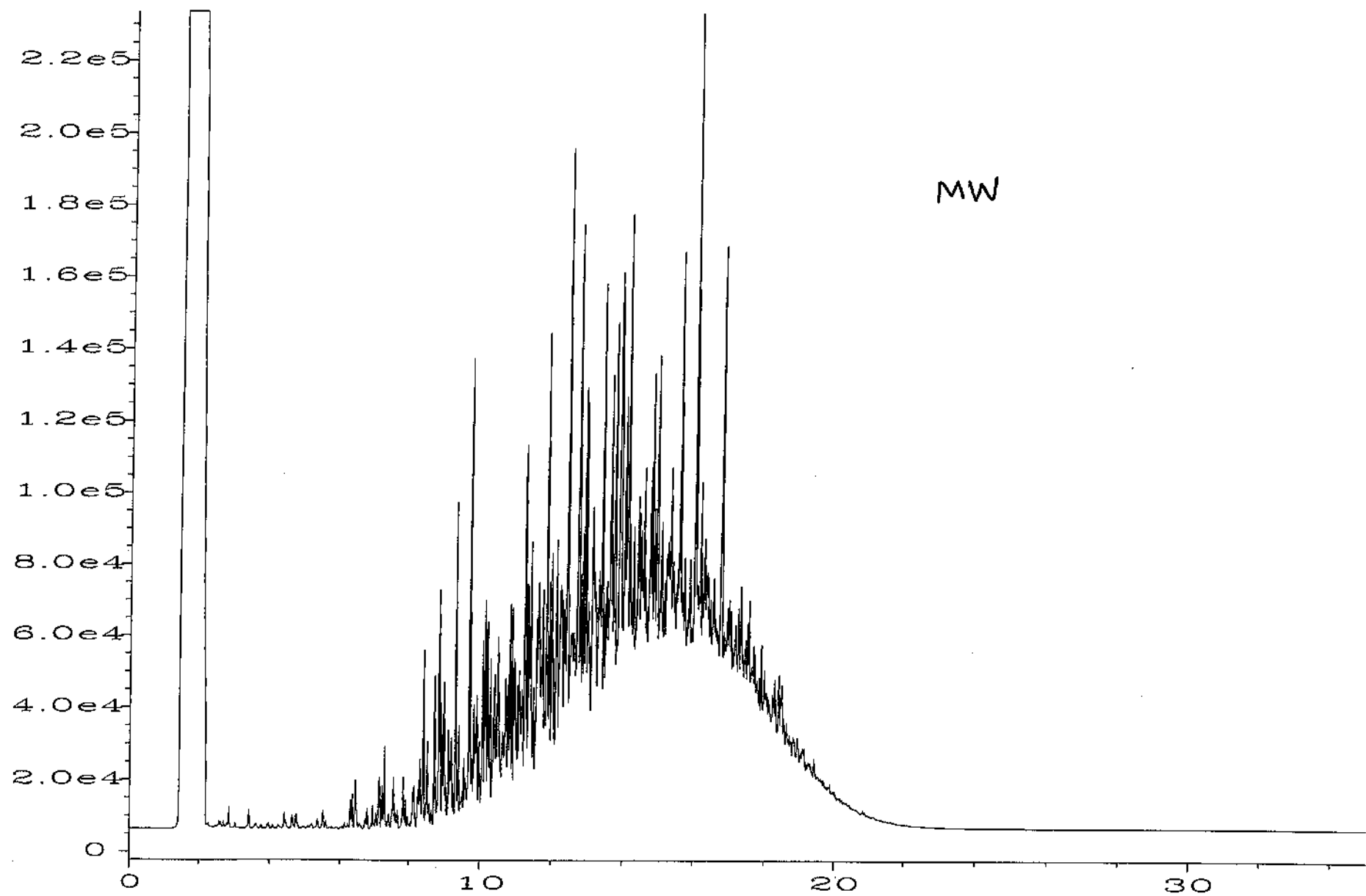
Sample ID:	MW	Diesel UST	#2 Fuel Oil UST
Matrix:	Liquid	Liquid	Liquid
Date Received:	7/23/96	7/23/96	7/23/96
Units:	%	%	%
Date of Extraction:	7/25/96	7/25/96	7/25/96
Date of Analysis:	7/25/96	7/25/96	7/25/96
Analyst:	DJS	DJS	DJS
EPA Method:	8100(mod)	8100(mod)	8100(mod)
Identification	Carbon Range		
Fuel Oil #2	C9-C24	> 90	> 90

Approved By: Timothy Schaper, Organics Supervisor











6112

*professional laboratory services*

Diesel UST	1
No. 2 Fuel Oil UST	1

Results Needed By: 8-2-96	
EAI USE ONLY	T: M:
NOTES: ① Product would not form meniscus to permit sealing of 40-ml vial without air bubble. ② Sufficient volume for only one 40-ml vial; no air bubble upon collection.	

Project No. 7964873 P.O. No. \_\_\_\_\_

Project Name Taylor Appliances

Sampler(s) Kristen Underwood

Sheet 1 of 1